IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

TESSERA ADVANCED TECHNOLOGIES, INC. Plaintiff, v. SAMSUNG ELECTRONICS CO. LTD. AND SAMSUNG ELECTRONICS AMERICA, INC., Defendants.	Case No. 2:17-cv-00671-JRG **JURY TRIAL REQUESTED**

TESSERA ADVANCED TECHNOLOGIES, INC.'S REPLY CLAIM CONSTRUCTION BRIEF

TABLE OF CONTENTS

TABLE OF AUTHORITIES

CASES

TABLE OF EXHIBITS

Exhibit Number	Description
1-20	These numbers refer to the attachments to Tessera's Opening Claim Construction Brief
21	Supplemental Declaration of Dr. Jack Lee
22	U.S. Patent Application 2004/0187303 (TATI-SAM-00011470)
23	U.S. Patent No. 5,604,379 (SAMS232-0028192)
24	Samsung's Preliminary Invalidity Contentions Pursuant To Patent Local Rules 3-3 And 3-4 (excerpts)
25	*Samsung Elecs. Co., Ltd. v. Tessera Advanced Technologies, Inc.*, IPR2018-01264, Ex. 1002, Declaration of Miltiadis K. Hatalis, Ph.D. (June 15, 2018) (TATI-SAM-00009393)

I. TESSERA'S CONSTRUCTIONS SHOULD BE ADOPTED

A. "external electrode" / "external electrode terminal"

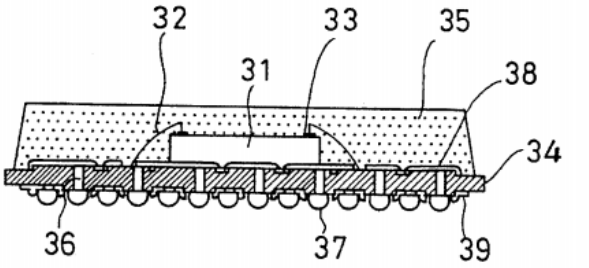
The Court should reject Samsung's proposed constructions, as it is now apparent that Samsung intends for "external" to be construed in a way that means "internal." Although Samsung claims to agree that the "external electrode terminals" and "external electrode" are structures that physically connect a chip to "external equipment," (*i.e.*, equipment external to the packaged chip), Samsung's brief reveals that it intends to argue, via its faulty constructions, that they actually connect to terminals ***internal*** to the packaged chip.

Specifically, Samsung contends that "external electrode terminals" and "external electrodes" can be ***internal*** connections inside the packaged chip because the claims and specification do not teach that the invention relates to "CSP, WLCSP, or any other type of semiconductor package." (Samsung Br. at 1, 11.) Samsung is mistaken. As the specification states, the "present invention relates to a semiconductor device . . . that allows a ***high-density packaging provided with wires or electrodes*** that connect the semiconductor integrated circuit section to the terminals of external equipment." ('298 patent at 1:6-13.) The patents describe "a technique to form [a] CSP (chip size package) within semiconductor wafers" called "wafer level CSP," and they are directed to overcoming a problem arising in "conventional wafer level CSP." (*Id.* at 1:16-22.) Indeed, Samsung itself acknowledged in its IPR petitions that the '298 and '616 patents are "directed to forming a 'chip size package' or 'chip-scale package' (CSP) 'within semiconductor wafers,' also known as a 'wafer level CSP.'" (Ex. 6 at 4-5; Ex. 7 at 4-5.)

Nor does Samsung address Dr. Lee's unrebutted testimony that the "external electrode terminals" and "external electrodes" must mediate connections ***outside*** the packaged chip to achieve the patents' objective "to provide a semiconductor device that allows high-speed transmission of signals between the semiconductor device and external equipment while

compactness is achieved."[1] ('298 patent at 2:32-36; Ex. 1 ¶ 44.) And it is well-settled that the claims should be construed to achieve the goals of the patent. *See Asyst Techs. Inc. v. Emtrak, Inc.*, 402 F.3d 1188 (Fed. Cir. 2005) (rejecting construction "in tension with . . . the objectives of the [patent] as expressed in the specification and the prosecution history"); *Praxair, Inc. v. ATMI, Inc.*, 543 F.3d 1306, 1324 (Fed. Cir. 2008) (construing claims as necessary to "achieve the overall object of the invention").[2]

Samsung's remaining arguments against Tessera's constructions have no merit. Samsung argues that a single extrinsic reference, U.S. Patent 5,604,379, shows an "external electrode" as an internal interconnection between a die and its package. But Samsung misreads the patent. The patent describes "solder ball 37" as "external electrode[s]" or "external terminals" when they are used as terminals on the outside of a conventional wire-bond package. (Ex. 23 at Fig. 16, 1:32-54; Ex. 21 ¶ 6.)[3] Samsung also argues that the prosecution history supports its position because the patentee did not raise Tessera's construction in distinguishing a prior art reference. (Samsung Br. at 12-13.) This argument fails because there is no requirement that a construction



[1] As Dr. Lee explains, if the claims were construed to cover only an internal portion of the signal path between the die and the outside of the package, the claims would not guarantee a short signal path appropriate for high-speed or high-frequency signals. Ex. 1 ¶ 44.

[2] Tessera inadvertently cited the consistent *Praxair* instead of *Asyst Techs.* in its opening brief. Both cases are consistent.

[3] Consistent with Tessera's construction, the '379 patent consistently refers to terminals on the outside of the package as "external" terminals or electrodes. (*See, e.g.*, Ex. 23 at Fig. 10, 4:48-55 (identifying terminal on the outside of wafer level package as an "external electrode"), 1:32-37 (identifying solder balls on the "bottom surface of the package used as external terminals").) Samsung also misquotes the patent—the patent does not refer to solders balls connected to a "package substrate," it refers to solder balls connected to a "packaged substrate 18," which is a mounting surface external to the packaged chip. (*Id.* 6:28-37; Ex. 21 ¶ 5.)

be raised during prosecution, especially when it is not necessary to overcome the prior art. But more importantly, the patentee never adopted any position that is contrary to Tessera's proposed constructions. *Cf. Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325 (Fed. Cir. 2003) ("[F]or prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable."). Samsung further contends that Tessera's construction reads out an embodiment where the "external electrode terminal" is a portion of the "external electrode," but the basis for Samsung's argument is the position of the external electrode in an embodiment where the external electrode terminal is ***not*** a portion of the external electrode. (Samsung Br. at 11 (referencing the "insulating film 17" shown in the embodiment of the patents' figures).)

Samsung's constructions are erroneous for at least two additional reasons. *First*, Samsung imports the limitations "configured to ***contact*** an 'external electrode terminal'" and "metallic ball, conductive bump, or a portion of the [first/second] external electrode" from the examples provided in the specification. But limiting claim terms to the examples provided in the embodiments is not proper. *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365-66 (Fed. Cir. 2012) ("It is likewise not enough that the only embodiments, or all of the embodiments, contain a particular limitation."). And none of the language Samsung identifies in the specification to support these extra limitations gets anywhere close to the required definition or disclaimer. *See id.*

Second, while Samsung contends that its constructions give meaning to the phrase "external" by referencing "external equipment," Samsung does not dispute that it intends to read its constructions on ***internal*** connections between a die and its package substrate in a "flip-chip" ball grid array package. (Samsung Br. at 10.) Samsung's construction is ambiguous and should be accordingly rejected. *See, e.g.*, *USA Video Tech. Corp. v. Time Warner Cable, Inc.*, No. 2:06-

CV-239, 2007 WL 4365773, at *12 (E.D. Tex. Dec. 12, 2007) (construing term to avoid jury confusion based on a jury's natural inclination to find terms synonymous); *Tessera, Inc. v. Micron Tech., Inc.*, 423 F. Supp. 2d 624, 631 (E.D. Tex. 2006) (rejecting language that would confuse a jury as an attempt by defendants "to use claim construction as a plank in its trial strategy without any concomitant benefit to the jury" (citing *Sulzer Textil A.G. v. Picanol N.V.*, 358 F.3d 1356, 1366 (Fed. Cir. 2004))). Samsung seeks leeway to draw an arbitrary line between purported "internal" and "external" structures—effectively reading "external" out of the claim. The Court should enter Tessera's construction precisely to give clarity and meaning to the term "external."

B. "thick conductive film selectively on the first, thin conductive film"

Samsung appears to have abandoned any argument that the term "selectively" is indefinite and now asserts that the words "thick" and "thin," render this term indefinite. While Samsung never previously made this argument, it also fails. (Ex. 24 at 108-10.)[4]

A term is definite where "the patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus*, 134 S. Ct. at 2129. A term may have "some modicum of uncertainty" so long as the patent "apprise[s]" persons of skill in the art "of the scope of the inventions." *Id.* at 2128. Here, there is no question that persons of skill in the art are apprised of the scope of the inventions. The "thick" and "thin" terms refer to the fact that the "thick conductive film" is thicker than the "thin conductive film."

The definiteness of this term is confirmed by the intrinsic record. *First*, surrounding limitations in claim 1 of the '616 patent describe removing a whole "portion" of the "thin

[4] Samsung's invalidity contentions did state that the term "substantially continuous, thin conductive film" was indefinite, but Samsung did not identify that term for construction. (Ex. 24 at 108-09.)

conductive film" while removing "only an upper portion" of the thick conductive film. ('616 patent at claim 1.) Persons of skill in the art would understand that "only an upper portion" of the thick conductive film is removed because the thick conductive film is thicker than the thin conductive film. (Ex. 21 ¶ 2.) Likewise, the specification discloses a well-known technique called "electroplating" in which a thin conductive film is first deposited to act as a seed or adhesion layer. ('298 patent at 9:27-32; Ex. 21 ¶ 2.) Next, the thin conductive film is charged to facilitate deposition of a thicker conductive film on portions of the thin conductive film (*e.g.*, to form a wire). ('298 patent at 9:27-32; Ex. 21 ¶ 2.) In the preferred embodiment of the figures, the thin conductive film is deposited with a thickness of 0.7 μm. ('298 patent at 9:11-17.) The thick conductive film is then electroplated with a thickness of 10 μm. (*Id.* at 9:27-32.)

The definiteness of this term is also confirmed by the extrinsic evidence because its usage in the patents "aligns with the term's ordinary meaning understandable to those skilled in the art." *Finjan, Inc. v. Proofpoint, Inc.*, 13-cv-05808, 2015 WL 7770208 at *12 (N.D. Cal. Dec. 3, 2015). As Dr. Lee explains, techniques like electroplating that use a combination of a thin conductive film and a thick conductive film are well known in the art. (Ex. 1 ¶¶ 50-52.) The terms "thin" and "thick" are commonly used to distinguish the thicker electroplated film from the thinner seed film.[5] (Ex. 21 ¶ 2; *see* Ex. 22 ¶ 40 (describing depositing "a ***thick layer of sputtered, evaporated or preferably electroplated metal 60***" on a "seeding metallurgy 50").) Indeed, that is precisely how Samsung's expert used the term before the PTAB. (Ex. 25 at 46 ("A POSA would have known that, as compared to sputtering, electroplating is a faster and less expensive method that enables

[5] As the patent describes, thin conductive film seed layers are commonly made of materials like TiW and deposited in small quantities using electroless processes like sputtering, vacuum evaporation, or CVD. ('616 patent at 8:8-10, 9:15-21; Ex. 21 ¶ 3.) The seed layers generally have worse electrical properties than the thicker electroplated layers, and as a result, they are kept appreciably thinner. (*Id.*)

the selective formation of significantly thicker conductive films."), 122 ("Sputtering and electroplating differ only in how the second, thick film is formed and patterned . . . ."); *see also* Ex. 9 at 79 ("The process of selectively patterning a ***thick top layer of conductive film on a seed layer*** is commonly used in the prior art to create sharper conductive patterns.").) Samsung admitted that this was common usage in its invalidity contentions: "as a PHOSITA would have commonly known by the late 1990s, semiconductor devices are often fabricated using 'through-mask' plating processes with multiple layers of conductors to produce sharper and more vertical conductor patterns whereby ***thicker conductive layers on top of thin conductive films*** are used as connecting wires to connect to element electrodes and/or as a masking element." Ex. 24 at 87-88.

Finally, Samsung's own statements to the PTAB contradict its argument that these terms are indefinite. Neither Samsung nor its expert told the PTAB that the terms "thick conductive film" or "thin conductive film" were indefinite. To the contrary, Samsung and its expert readily understood their meaning and applied them precisely as Tessera proposes. (*See, e.g.*, Ex. 25 at 61-62 ("The ***thicker*** copper and gold film thus disclose a 'second, thick conductive film' formed on the 'first, thin conductive film.'"), 65 ("Yanagida discloses forming BLM films 6a, 6b, and 6c comprising a thin lowermost 'Cr film' and a ***thicker*** combined 'Cu film and . . . Au film' on the Cr film . . . ."), 122 ("Tokushige's electroplating method first sputters a continuous 'Cu thin film layer 6' (0.1-0.2μm thick), which later serves as 'plating electrode,' and then, using a resist pattern, selectively electroplates a ***thicker*** 'wiring layer 7' (2-5μm thick) on portions of the plating electrode not covered by the resist."); Ex. 9 at 79.)

C. "fill up"

Samsung apparently intends to argue to the jury that the term "fill up" requires that the thick conductive film be as thick as the side walls of the opening in the insulating film. (*E.g.*, Samsung Br. at 26.) Samsung's interpretation cannot be squared with plain meaning, the claims,

or the specification.

As Tessera explained in its opening brief, the phrase "so as to fill up the first opening and the second opening" in claim 1 of the '616 patent specifies where the thick conductive film is "selectively formed"—it is not a requirement as to the thickness of the film. ('616 patent at claim 1 (***forming*** a second, thick conductive film ***selectively*** on the first, thin conductive film ***so as to fill up the first opening and the second opening and extend over portions of the first, thin conductive film between the first and second openings***"); (Ex. 1 ¶ 49.). This is reinforced by the specification, which discloses several preferred embodiments in which the thickness of thick conductive film (10 μm) is much smaller than the height of the walls of the openings in the insulating film (20 μm, 50 μm, or more). ('616 patent at 8:8-14, 8:63-67, 9:31-36, 12:21-27.) This is further confirmed by dictionary definitions of the plain meaning of "to fill" an opening or gap, which includes to "plug" or span the gap. (*See* Ex. 10 at 509; Ex. 11 at 659; Ex. 12 at 434-35; Ex. 13 at 956; Ex. 14 at 418.)

Samsung's plain meaning arguments are unavailing. Samsung argues that other definitions of the term "fill up" include to "make or become full to capacity, fill completely." (Samsung Br. at 26.) While that may be one of the definitions, limiting the claim to that definition would be improper because when multiple plain meanings are consistent with a specification, the plain and ordinary meaning of the term is broad enough to encompass both—as Tessera's construction reflects. *See Inverness Med. Switz. GmbH v. Warner Lambert Co.*, 309 F.3d 1373, 1379 (Fed. Cir. 2002) ("[A] word that has an ordinary meaning encompassing two relevant alternatives may be construed to encompass both alternatives."). To the extent the definitions do conflict, the conflict should be resolved in favor of Tessera's construction because, as discussed above, Tessera's construction is consistent with the intrinsic evidence. The definitions identified by Tessera relate

to filling a hole or opening—as do the claim terms. (*See* Ex. 10 at 509 (defining "fill" as "to stop or plug up (***an opening, for example***)."); Ex. 13 at 956 (defining "fill" as "[p]lug (***a hole or gap***) with material"); Ex. 14 at 418 (defining "fill" as "[t]o plug up (***e.g., an opening***)").) Samsung's "fill completely" definition, by contrast, is inconsistent with the patent's disclosure of numerous embodiments in which the thick conductive film is not thick enough to fill the opening completely. (Ex. 21 ¶ 9.)[6]

Samsung argues that its interpretation does not read out the preferred embodiment shown in the figures of the '616 patent. Samsung is mistaken. Samsung's argument rests entirely on conclusions drawn from measuring patent figures that are ***not to scale***. (Ex. 21 ¶ 9.) A patent figure that is not to scale cannot overcome the disclosure in the specification. *See Hockerson Halberstadt, Inc. v. Avia Grp. Int'l, Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000) ("[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue." (internal citations omitted)). As the specification explains, the thick conductive film of the embodiment of the figures is 10 μm in thickness. ('616 patent at 9:31-36.) The thin conductive film of the figures is 0.7 μm in thickness. ('616 patent at 8:8-14.) Together the conductive films are 10.7 μm in height. By contrast, the insulating film (in which the openings are formed) is 20 μm in height. ('616 patent at 8:63-67.) The conductive films of the embodiment of the figures will thus fill the opening in the insulating film to only about half of the height of the opening. (Ex. 21 ¶ 9.)[7]

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[6] Samsung also contends that Tessera conflates "fill up" with "fill." Not so. Tessera's construction embraces only embodiments in which the opening is fully spanned or plugged—not embodiments where only an incomplete portion of the opening has been covered.

[7] Samsung argues that the height of the element electrode 11 should be added to the height of the films. This is wrong. The insulating film is formed on top of the element electrodes—it is not filled by the element electrodes. ('616 patent at 8:63-67 ("[A] low elastic modulus layer 14 is

Samsung also reads out other embodiments in which the insulating film (and thus the sidewalls of the opening) are even larger. (Ex. 21 ¶¶ 9-10.) In particular, the patent discloses that in preferred embodiments, the insulating film is "about 50 μm or more." ('616 patent at 12:21-23.) That means that the conductive film will fill even less of the opening in the insulating film—not fill it "completely" as Samsung contends. Aware of this problem, Samsung contends that the thickness of the conductive films must be scaled to account for the increasing height of the openings. (Samsung Br. at 23.) But neither Samsung nor its expert point to any disclosure in the specification to support this argument. *Cf. Rohm and Haas Co. v. Brotech Corp.*, 127 F.3d 1089, 1092 (Fed. Cir. 1997) ("Nothing in the rules or in our jurisprudence requires the fact finder to credit the unsupported assertions of an expert witness."). Samsung cannot use attorney argument and unsupported expert testimony to overcome the express disclosure in the '616 patent's specification. *See Philips v. AWH Corp.*, 415 F.3d 1303, 1318 (Fed. Cir. 2005) ("[A] court should discount any expert testimony 'that is clearly at odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent.'").

D. "a protective film formed … having a property of repelling conductive material" / "forming a protective film having a property of repelling conductive material"

Samsung does not cite a single piece of evidence purporting to show that the claims "fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus*, 134 S. Ct. at 2124. Rather, Samsung focuses on the strawman argument that Tessera allegedly argues that these terms are coextensive with the "solder resist film" used in the patents' preferred embodiments. (Samsung Br. at 28.) This is not and has never been Tessera's position.

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formed on the semiconductor substrate 10 so as to cover the element electrodes . . . ."). As a result, the insulating film will rise about 20 μm above the element electrodes. (Ex. 21 ¶ 8.)

As Tessera explained in its opening brief, the term "having a property of repelling conductive material" has a well-understood meaning in the field of the patents, and the patents use solder resist films as an example of such a material. Tessera presented unrebutted argument and evidence that a material has a property of repelling conductive material when it is unwettable by conductive material. (*See, e.g.*, Tessera Br. at 21-22; Ex. 1 ¶¶ 42, 54.) The materials that have a property of repelling conductive material (e.g., solder resists), are well-known and well-understood by persons of skill in the art. (Ex. 1 ¶¶ 54, 58.) Tessera pointed to a wealth of extrinsic evidence of persons of skill in the art applying the term without confusion and in the manner described by Tessera. Ex. 17 at 4; Ex. 18 at 11:48-51; Ex. 19 at 12-13; Ex. 20 at 74.) None of this evidence is addressed or rebutted in Samsung's brief.

In attempt to reconcile its current position with the position it took in its IPRs—where Samsung and its expert readily understood what these terms mean—Samsung argues that *Interval Licensing LLC v. AOL, Inc.*, 766 F.3d 1364 (Fed. Cir. 2014) allows "invalidity defense using a reference that teaches the embodiments disclosed in an asserted patent's specification while simultaneously maintaining an indefiniteness challenge." (Samsung Br. at 19.) First, *Interval Licensing* says nothing about the ability of an expert to apply an indefinite claim term to the prior art. *Id.* at 1367 n.2 (mentioning but not ruling on the propriety of a co-pending reexamination proceeding). Second, Samsung does not and cannot dispute that its expert interpreted these terms exactly the way Tessera does, and never once implied or stated that one of ordinary skill in the art would not understand what they mean. These terms are not indefinite.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing document was filed electronically in compliance with Local Rule CV-5(a). Therefore, this document was served on all counsel who are deemed to have consented to electronic service. Local Rule CV-5(a)(3)(A). Pursuant to Fed. R. Civ. P. 5(d) and Local Rule CV-5(d) and (e), all other counsel of record not deemed to have consented to electronic service were served with a true and correct copy of the foregoing by email on this the 24th day of August, 2018.

/s/ Andrea Fair
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